

**REMARKS**

Claims 1-25 are all the claims pending in the application. New claims 21-25 have been added, based on, for example, page 1, fifth paragraph; page 2, second and third paragraphs; and page 8, first, second and third paragraphs of the specification.

Since the amendments raise no new issues, entry of the above amendments is respectfully requested.

Preliminarily, Applicants would like to thank the Examiner for the telephone interview conducted with Applicants' representative on August 14, 2007. Applicants believe that the interview was helpful in advancing the prosecution of the present application.

In addition, the Examiner is respectfully requested again to indicate that the drawings have been accepted.

**I. Response to Rejection of Claims 1-2, 5, 8, 15 and 19 under 35 U.S.C. § 103(a)**

Claims 1-2, 5, 8, 15 and 19 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Derule et al. (US 5,683,751) in view of Emmonds (US 6,676,820).

Applicants respectfully traverse the rejection.

Claim 1 is directed to a method of treatment by carboxylation, before shaping, of a metal surface in oxidizing conditions in relation to the metal, comprising bringing the said metal surface selected from the group consisting of zinc, iron, aluminum, copper, lead, alloys thereof, galvanized steel, aluminium-coated steel, and copper-coated steel into contact with an organic or hydro-organic aqueous bath comprising at least one organic acid in free form or in the form of salt, wherein: the said organic acid is a saturated or unsaturated aliphatic monocarboxylic or dicarboxylic acid, the said organic acid is in solution and/or in emulsion in the bath at a

concentration greater than 0.1 mole/litre, and the pH of the bath is acidic.

In the present invention, the metal surface is treated under oxidizing conditions. The specification discloses that different oxidants, such as dissolved oxygen ( $O_2$ ), nitrates ( $NO_3^-$ ), hydrogen peroxide ( $H_2O_2$ ) or perborates ( $BO_3^-$ ) can be used. *See* page 8 and 17. Specifically, in the present invention, the reaction involved is carboxylation, which is a reaction of an acido-basic type.

For example, if a zinc-covered metal sheet were used, the zinc present at the surface is oxidized by the acid present in the reaction medium and is transferred into the reaction medium as  $Zn^{2+}$  ions, whereby the metal elements on the surface are dissolved. The ions then recombine with the carboxylate present in the medium, which is the conjugated base of the carboxylic acid dissolved in the medium. As a result, a precipitate of Zn carboxylate is formed on the sheet.

The Examiner recognizes that Derule does not teach oxidizing conditions as recited in claim 1. To make up for the deficiencies of Derule, the Examiner cites Emmonds as teaching a process for electrocoating metal blanks by immersing metal blanks and electrodes in an electrolytic coating bath (Fig. 2).

Applicants respectfully submit that Derule alone, or in combination with Emmonds, does not teach or suggest the present invention according to claim 1.

Derule relates to a process for surface treatment of sheet steel partially coated with zinc or zinc alloy. Specifically, the objects Derule is provided by a process for surface treatment of steel, partially or wholly coated with a layer of zinc or zinc alloy, in which the surface of said steel or steel sheet is treated with an aqueous corrosion-inhibiting solution. *See* col. 2, lines 29-

35. In addition, in the Examples, the solution is deposited by spraying or coating. Thus, in Derule the surface treatment composition is applied to the metal surface and the metal surface of Derule is not dissolved. Thus, there is no metal that reacts with any carboxylic acid to form a precipitate of a metal carboxylate on the sheet.

Since there is no interaction between the metal surface and the treatment composition, the process of Derule is different from the claimed process.

In addition, one of ordinary skill in the art would not be motivated to modify Derule by dissolving the surface of the metal layer, particularly since the objects of Derule are achieved by applying a composition to the surface of the metal.

Furthermore, Emmonds does not make up for the deficiencies of Derule. Emmonds does not describe a carboxylation process where a carboxylic acid contained in the bath, in which the metal surface is immersed, reacts alone with the metal surface in order to form a carboxylate layer. Similar to Derule, in the process of Emmonds, there is no interaction between the components in the polymer coating and the metals in the metal surface.

That is, the process of Emmonds consists of depositing a primer layer of a resin onto a metal surface, and then depositing a top coat layer of a second resin on the primer layer. Thus, Emmonds relates to coating metal sheets with at least a polymer layer. Specifically, Emmonds discloses that the invention is directed to a process for forming a coating on a pre-sheared, electroconductive flat blank. *See* col. 1, lines 10-12. In addition, Emmonds discloses multi-composite coating (multi-layer coating), and if the surface of the first coating was removed then a multi-layer composite would not be formed. Thus, Emmonds is directed to a process that is different from the claimed process and does not teach or suggest a metal sheet with a

conversion layer of crystals of a metal carboxylate.

In view of the above, even if Derule and Emmonds were somehow combined, the combination would not teach or suggest all of the elements of claim 1 as required under §103 since neither reference teaches a reaction in oxidizing conditions by which the metal in the surface is dissolved.

For the foregoing reasons, it is respectfully submitted that a *prima facie* case of obviousness has not been established and that claims 1-2, 5, 8, 15 and 19 are patentable over the cited art.

Withdrawal of the rejection is respectfully requested.

**II. Response to Rejection of Claims 1-7, 10-11, 14, 16 and 18-20 under 35 U.S.C. § 103(a)**

Claims 1-7, 10-11, 14, 16 and 18-20 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Carson et al. (US 4,720,405) in view of Derule and Blum (US 5,331,039).

Applicants respectfully traverse the rejection.

The Examiner takes the position that Carson does disclose a carboxylic acid because a carboxylic acid is required to form the polyester, and thus, there will be a carboxylic acid in the coating solution. In addition, the Examiner asserts that the concentration of carboxylic acid is a result-effective variable that affects the final coating layer, and thus, one of ordinary skill in the art would be motivated to routinely optimize the concentration. Further, the Examiner relies upon Blum as teaching a coating composition for metal surfaces comprising carboxylic acids and hydrogen peroxide (col. 5, lines 23-41 and col. 12, lines 37-51), and takes the position that one of ordinary skill in the

art would be motivated to use the hydrogen peroxide of Blum in the composition of Carson and Derule to jump start the redox and polymerization reactions.

Applicants respectfully disagree.

Claim 1 recites "organic acid in free form or in the form of salt".

As noted previously, Carson relates to a method of providing a substrate with a flexible multilayer coating comprising as one component an organic polyol, such as acrylic polyols, polyester polyols, polyurethane polyols and polyether polyols. *See* Abstract, col. 1, ones 62-63 and col. 2, lines 52-54. Carson discusses polyester polyols at col. 3, line 15 et seq. and that the polyester polyols can be prepared by the polyesterification of an organic polycarboxylic acid or anhydride thereof with organic polyols and/or an epoxide.

Thus, the disclosure relied upon by the Examiner is directed to the acid component of the polyester, i.e., the acid portion of the polyester. The acid portion of the polyester is clearly not an organic acid in free form or in the form of a salt as recited in claim 1.

In addition, although the acid component of the polyester may consist of a C2-C18 carboxylic acid, nothing in Carson discloses or suggests that this carboxylic acid could be in the coating in an isolated state or in a salt state which would allow it to react alone with the metal surface in order to form a carboxylate layer.

Also, since Carson does not disclose the use of an organic acid in free form or in the form of a salt, Carson does not disclose the claimed concentration of the organic acid. In this regard, even if there were some residual carboxylic acid present from the formation of the polyester polyol, as asserted by the Examiner, impurities would not be present in the claimed concentration to form a carboxylate layer.

Furthermore, Carson relates to providing a substrate with a flexible multilayer coating. For example, Carson discloses that the process is suitable for coating a wide variety of metal substrates including steel and aluminum, and that the primer coating composition is applied to the substrate. Thus, there is no teaching or suggestion in Carson that there is any interaction between the metal surface and the coating composition, i.e., dissolution of the metal surface and formation of a metal carboxylate layer.

Moreover, one of ordinary skill in the art would not look to Derule or Blum to modify Carson to arrive at the claimed invention.

For the above reasons, it is respectfully submitted that a *prima facie* case of obviousness has not been established, and that claims 1-7, 10-11, 14, 16 and 18-20 are patentable over the cited art.

Withdrawal of the rejection is respectfully requested.

**III. Response to Rejection of Claims 8-9 under 35 U.S.C. § 103(a)**

Claims 8-9 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Carson and Derule, in view of Blum and Toman (US 4,877,838).

Applicants respectfully traverse the rejection.

Claims 8-9 depend indirectly from claim 1, and thus, it is respectfully submitted that these claims are patentable for at least the same reasons as claim 1 discussed in Section II above.

Accordingly, withdrawal of the rejection is respectfully requested.

**IV. Response to Rejection of Claims 12-13 under 35 U.S.C. § 103(a)**

Claims 12-13 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over

Carson and Derule, in view of Blum and Hughes et al. (US 6,206,982 B1).

Applicants respectfully traverse the rejection.

Claims 12-13 depend, directly or indirectly, from claim 1, and thus, it is respectfully submitted that these claims are patentable for at least the same reasons as claim 1 discussed above in Section II.

Accordingly, withdrawal of the rejection is respectfully requested.

**V. Response to Rejection of Claim 15 under 35 U.S.C. § 103(a)**

Claim 15 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Carson, Derule and Blum, in view of Emmonds et al.

Applicants respectfully traverse the rejection.

Claim 15 depends from claim 1, and thus, it is respectfully submitted that claim 15 is patentable for at least the same reasons as claim 1 as discussed above in Section II.

Accordingly, withdrawal of the rejection is respectfully requested.

**VI. Response to Rejection of claim 17 under 35 U.S.C. § 103(a)**

Claim 17 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Carson, Derule and Blum, and in view of Melotik (US 3,969,152).

Applicants respectfully traverse the rejection.

Claim 17 depends from claim 1, and thus, it is respectfully submitted that claim 17 is patentable for at least the same reason as claim 1 as discussed above in Section II.

Accordingly, withdrawal of the rejection is respectfully requested.

**VII. New Claims 21-25**

Claims 21-25 depend, directly or indirectly, from claim 1, and thus, it is respectfully submitted that these claims are patentable for at least the same reason as claim 1 as discussed above.

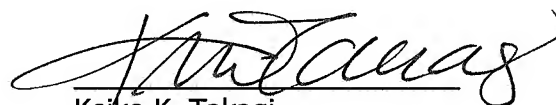
**VIII. Conclusion**

For the foregoing reasons, reconsideration and allowance of claims 1-25 is respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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